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Elementary Agriculture and Horticulture and School Gardens in Village and Rural Schools

Explanatory and Descriptive Circular.

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Elementary Agriculture and Horticulture.

(*From the amended Regulations of 1907.*) See Cir 33/
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1. Any Rural School Board, or any School Board in a village, that provides and maintains a School Garden with the accommodations and equipment prescribed below shall be entitled to an initial grant not exceeding one hundred dollars, and a subsequent annual grant of twenty dollars out of any grant made for Elementary Agriculture and Horticulture by the Legislature, to be expended in caring for such School Gardens and for keeping the school grounds in proper condition.

2.—(1) The area of the School Garden shall be sufficient for the number of plots required, and shall be at least one-quarter of an acre in addition to the requirements as to area of the regular school grounds in each case prescribed by the Education Department. The School Garden shall be adjacent or convenient to the regular school grounds.

(2) The School Board shall provide the necessary tools, implements, seeds, and other requisites, and also a garden shed, or a suitable apartment, for the storage thereof and for use as a working laboratory.

3. One legally qualified teacher in each school who holds a certificate from the Macdonald School at Guelph or any other institution approved by the Minister of Education, that he is competent to give instruction in Elementary Agriculture and Horticulture, and who shall thereafter give instruction, approved by the Inspector, in said subject at any Rural or Village Public School having a School Garden attached, in accordance with the Regulations of the Education Department from time to time, shall be entitled to receive an allowance at the rate of thirty dollars a year from any sum voted by the Legislature for these subjects.

4.—(1) Should the sum voted by the Legislature not be sufficient to pay in full the grants on the foregoing bases, the Education Department will make a *pro rata* distribution of the sum voted.

Teachers intending to qualify as teachers of Elementary Agriculture and Horticulture under the above regulations should address the Ontario Agricultural College, Guelph, for particulars. Teachers who have already taken Nature Study courses at Guelph will have their work accepted in part.

School Boards desiring to start a forestry plot in their School Gardens may obtain a free supply of seedling trees on application to the Forestry Department, Ontario Agricultural College, Guelph. These seedlings include Norway Spruce, White Pine, Scotch Pine, White Cedar, White Ash, Black Locust, Manitoba Maple, Catalpa and Tulip Tree, or White Wood. In addition to these the seeds of the more important trees of the locality should also be planted, including, if practicable, Oak, Pine, Maple, Birch, Hickory, Butternut, Walnut, Chestnut, Basswood, etc.

SCHOOL GARDENS.

I. GENERAL AIMS.

To stimulate interest in rural life;

To provide healthful exercise for body and mind, and to afford to the pupil an opportunity to direct his activities along useful lines;

To develop at an early age habits of industry, respect for labor, and a love for productive and constructive work;

To impart useful information in agricultural subjects;

To give facility in the handling of tools and in the practice of garden craft;

To promote the desire to improve home surroundings and to train boys and girls to do such work with efficiency;

To promote the qualities that make for good citizenship, such as the responsibility of ownership, respect for public property, consideration for the rights of others and the principle of co-operation in seeking the common good;

To encourage careful observation of nature; thus enabling the pupil to understand his environment and to appreciate more fully the beautiful in nature;

To promote a spirit of independent investigation in other branches of study;

To bring the life and interests of the school more closely into touch with the home life of the pupils.

II. ORGANIZATION.

Location of the Garden.—So as to be easily accessible, the garden should be convenient to the school room. If possible, it should be situated in a part of the grounds that can be seen from the windows of the Principal's class-room. The safety of the garden as well as the convenience of the pupils should be kept in mind. Accordingly, the garden should not in any way interfere with the usual outdoor games. Accordingly, also, either a strong hedge or a woven-wire fence should divide the garden from the play-ground. If the garden has a southern exposure so much the better; if not, protection from storms and cold north winds may be secured by planting along the north and the west sides a wind-break of evergreens. Such planting should not be allowed to shut out a fine view from the school building; but, in some cases, it might be used to advantage to shut out unsightly or objectionable features outside the grounds. When practicable, the garden should be placed where it can be seen from the street or highway. It should be in harmony with the natural features of the grounds; or, in other words, it should occupy that place in the grounds where it will "look best."

Size of the Garden.—No school is too small to have a garden of some kind. The area of the garden does not determine its success. The best garden is the one the teachers and pupils have been most deeply interested in making.

The area of the garden will depend largely upon the area of the available grounds and upon the number of pupils taking part in the work. In a large graded school where the size of the garden is limited it may be arranged that gardening be taken up in certain grades only. The area will also be determined in part by the nature of the work carried on. Individual plots of flowers or vegetables require least space and are the all important feature. Larger class plots may be added for the growing of vegetables or grains that cannot conveniently be cultivated in small plots; and, if the garden is large enough, experimental plots in connection with farm crops, as well as forestry and fruit plantations, may be included.

A school ground one and one-half acres in extent might be divided up as follows: Boys' playground, ½ ac.; girls' playground, ⅜ ac.; front lawn, approaches, etc., ⅛ ac., pupils' plots in vegetables and flowers, ¼ ac.; field experiments, fruit and forestry plantations, ¼ ac.

Size of Plots and Paths.—The size of school garden plots will depend very largely upon the character of the work carried on and the age or ability of the pupils. For pupils in primary classes plots 3 ft. x 5 ft. are very satisfactory; for intermediate classes 3 ft. x 10 ft.; and for seniors 3 ft. x 20 ft. (or 6 ft. x 10 ft.). It will be noticed that the above plots have one dimension in common, viz., 3 ft. wide—this provision becomes more important as the plots are increased in number. If they are of the above size, each pupil should manage two, one for flowers and the other for vegetables; and the flower section of the garden may be separate from the vegetable section. For pupils in the primary class one plot may be considered sufficient, and in this case, both flowers and vegetables might be grown side by side. Class plots should not be smaller than 20 ft. x 20 ft., and plots for field experiments with potatoes, roots, grains, fodder crops, etc., might be 1 rod square or 1 rod x 2 rods, or 10 ft. 5 in. x 20 ft. 10 in. (1-200 of an acre). A walk at least 4 ft. wide should run all around the garden. Paths 3 ft. wide should run between class or experimental plots and between rows of individual plots. Narrow paths (1½ ft. wide) should separate individual plots in the same row. When once the paths and plots have been made and the corner stakes driven, they should not again be disarranged. The plots should be spaded in the fall, no horses being needed in cultivating the garden after the first year.

Garden Plans.—When the extent of the space available for the garden has been ascertained it is advisable to prepare a plan of the garden on paper which will show the exact size and location of the plots required. Such plans should be made with deliberation early in the spring before planting operations begin, and the pupils should be allowed to co-operate in the work. In addition to this general garden plan each pupil should make a plan of his or her own plot or plots, showing where the different varieties of plants chosen are to be grown. This exercise may form a suitable introduction to map drawing. Each pupil should have a garden note-book in which to record work done and observations made day by day. Such garden diary should contain a plan of the pupil's plots drawn to a scale and showing the arrangement of the plants in each plot.

Laying Out the Garden.—The chief requisites for laying out the garden are a tape-line, a long garden line, a supply of small stakes 1 inch square and 1 ft. long, and a hatchet or mallet to drive them down. The stakes for the large plots might be larger than these, and might be made by the boys at home or in the school work-room, if the school is fortunate enough to have such a room. The outside corners or main boundaries of the garden should first be located and marked with strong stakes. The outside walks should then be staked off, space for a border of flowering perennials measured off, and then the individual plots, class and experimental plots, etc., in the order mentioned, the stakes being driven at the points which are to be the corners of the plots.

Preparing the Plots.—The planning and staking out of the garden will, of course, be done by the teacher and the pupils. The making of the paths and the preparation of plots in a large garden, however, will usually necessitate the services of a competent man. Most of the boys and many of the larger girls will prepare their own plots with ease and despatch when they have once been shown how to do the work. The smaller boys and girls will need some assistance. In an ordinary garden the older boys may help the girls, and the smaller boys and hired help will not be needed. The plots should be made the exact size indicated by the four corner stakes. Level cultivation should be followed if the soil is very sandy. Otherwise it is desirable to raise the plots by removing a couple of inches of soil from the paths and placing it evenly upon the plots, which should be made of uniform height, raked level and all edges carefully trimmed with the rake and garden lines. If some well rotted manure is spaded into the plot before raking down, so much the better. Refuse in the form of hard lumps of earth, etc., should be raked out of the paths and removed in a wheelbarrow or used to fill up holes in the garden. In this as in all parts of the work the teacher should insist on care and accuracy. Nothing but the best efforts of the pupils should be accepted in the making, planting, and care of garden plots.

III. DETAILS OF WORK.

Notes on Planting.—Teachers with limited experience in gardening will find some difficulty at first in making a selection from seed catalogues for the school garden. To allow the pupils as much freedom as possible in choosing their own plants and at the same time safeguard them from possible failure and consequent disappointment may become one of the most difficult school garden problems. A few general rules and suggestions will prove helpful.* Beginners should choose the more familiar plants, especially those that do not require more than ordinary treatment. Young pupils should plant seeds that are easily handled, quick to germinate and sure to grow under ordinary conditions. These seeds the teacher should select. Pupils should not attempt to grow too many varieties in one season. Primary classes might try two varieties of flowers and two of vegetables, intermediate classes three or four varieties of each, and seniors up to six of each. A pupil might be allowed to cultivate only one variety if he so wished, but the tendency is to err in the other direction. After the first year the pupils should be encouraged to try at least one new variety of flower or vegetable each year and thereby gain a wide and practical knowledge of varieties. They might, however, be allowed to cultivate the same varieties year after year if they so desired. The older pupils should choose part of their varieties from the list of plants that require to be started early in hot-beds or window-boxes, so that they may become familiar with the work of transplanting.

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*A circular containing lists of tools and seeds for school gardens may be had on application to the Education Department.

Plants that grow very tall (corn, sunflowers, etc.) should not be put in small individual plots, as they tend to interfere with the light supply to low-growing plants near them. Vines also (squash, cucumbers, etc.) should be grown only in large plots, as they obstruct the paths and interfere with plants in neighboring plots. Different varieties of corn should not be planted side by side, as the wind will carry the pollen of one variety to the pistils of the other if planted near together, and mixed varieties will result. When planting in rows, the rows should run north and south, as the plants will get most sunlight evenly distributed when so planted. If the rows are short and must run east and west, the tall-growing plants should be planted at the north side of the plot.

Color schemes in planting should be encouraged amongst older and more experienced pupils. Flower designs also afford scope for the imagination and tend to encourage originality. Only low-growing plants of fairly compact habit should be chosen for flower designs or border work. Mass effects which result from growing only one variety of flower in a plot, add to the attractiveness of the garden. Some flowers, like the poppy, verbena, portulacca, or petunia, make a fine display when so grown. Every school garden should have a visitors' plot of fine flowers from which interested visitors would feel at liberty to "take one." The picking of flowers or vegetables from plots by persons other than the owners of those plots should be strictly prohibited.

Flowering perennials should be planted in borders along the front and sides of the garden, along walks, fences, etc., and late-flowering annuals may be transplanted into the perennial borders to provide bloom late in the season. Perennials, started from seed in August, protected throughout the winter by a light covering of leaves or straw, and transplanted to permanent positions in spring, will bloom that same year. Ornamental shrubs should be planted along the sides and in the corners of the grounds—never in the garden nor out in the open grounds where they would interfere with the playing of outdoor games. The same may be said of shade trees. Each pupil should know what he is to plant before planting day comes, and should submit a plan for his plot for the teacher's approval or for rearrangement. To avoid confusion in the garden, not more than a dozen pupils should be engaged in planting at one time. If the flower or vegetable seeds are to be put in in rows, the rows should be kept in perfect line across the garden, and if possible be a uniform distance apart. A garden line and a rule are needed for this purpose. A twelve-inch board about 6 ft. long will be found very useful in planting. It can be used as a straight-edge in making the drill for the seed, is convenient to stand on when sowing the seed, and, lastly, for firming the soil over the seeds when planted. It is very convenient to have the rake-handles marked off in feet and inches.

When the plots are ready and the drills made for the seed the teacher should place in the left hand of each pupil just enough seed to plant the row, giving at the same time a word of instruction as to how thick the seeds should be planted and how much earth should be put over them. Care should be exercised to prevent needless waste of seed. The seed should be taken between the thumb and index finger of the right hand

and spread thinly and evenly along. The finer and weaker the seeds the less covering they should have. If the soil is very dry it should be thoroughly watered the day before the planting is to be done. This is a much better practice than to sow seeds, and especially fine seeds, in a dry seed bed and then to water with the sprinkling can. The latter practice invariably causes a hard crust to form over the top, through which the young plants come up with difficulty, if at all; free access of air is prevented and the moisture necessary for growth is allowed to escape.

From one to three weeks after the seeds have been planted and when danger of frost is past, the transplanting from hot-beds or cold-frames may be done. If possible it should be done on a moist or cloudy day, otherwise it will be necessary to shade the plants with papers or shingles for a few days and to water them frequently. Water from a well should be allowed to stand in a tank or barrel for a few hours before being used on garden plants. The holes for the plants may be made with a transplanting trowel, or, if the plants are very small, with a sharpened stick. Before the plants are lifted they should be thoroughly watered to prevent the breaking of the delicate rootlets. They should be placed in the holes, using water if the soil is very dry, and the earth then firmly pressed around their roots. When set, they should be slightly deeper in the soil than before transplanting.

Care of the Garden after Planting.—When once the planting is done, two half-hours' work per week is sufficient to keep the garden in good condition. The prevention rather than the eradication of weeds should be aimed at. If cultivation is carried on regularly and systematically from the first, the weeds will all be destroyed in the germinating stage and will give no further trouble. Mere weed killing is not the greatest value to be gained by cultivation, however; for if the soil is thoroughly stirred around the roots of the plants a couple of times every week, the necessary supply of air in the soil for rapid growth will be ensured. In many cases the top soil forms into a hard crust, especially after a heavy rainfall, and in this hard soil are many little channels through which moisture escapes into the air by evaporation. This soil should be finely pulverized to a depth of two or three inches, thus forming an earth mulch which prevents the rapid escape of moisture from the soil. If mulching and cultivation are thus carefully attended to, the difficult problems connected with the weeding and watering of a garden are incidentally solved. The garden rake should supersede the sprinkling can under ordinary circumstances. Of course it is necessary to water plants after transplanting, and there are certain soils that need watering occasionally during a dry season, but such cases are not common. If artificial watering is needed it should be done in the evening and a plentiful supply should be given. Merely wetting the surface soil encourages shallow rooting and is injurious to the plants.

Care should be taken not to have the plants much crowded in the rows or the rows very close together. The ideal condition would be to have the plants so far apart that they would completely cover the ground without crowding when full grown. When the plants have reached this stage of development, if cultivation has been thoroughly and carefully done there will be no further danger from weeds, as weeds will not grow in such deep shade.

The detection and the treatment of garden pests is a matter of increasing importance to all gardeners, but it is especially important in connection with school gardening. Nature study with insects can be carried on to greatest advantage in a school garden. An insect at work in its own natural environment is immensely more interesting to the child and is of far greater importance from the Nature study point of view than an insect impaled upon a pin in a glass-covered box. The life history of some of the common garden insects can be studied, their feeding habits noted, and suitable insecticides used on the injurious ones. Fungus diseases of plants such as the potato blight and the tomato rot should also be studied and the pupils made familiar with the nature and use of such fungicides as Bordeaux mixture.

The blooming period of flowers can be prolonged by keeping the flowers closely picked. Seed should never be allowed to ripen unless wanted for subsequent planting, in which case only that from the finest blooms should be preserved. Such selection of seed can best be done by tying strings or labels around the flower stems before the bloom is gone.

Constant care should be exercised in keeping the garden tools in their allotted places. They should never be left out in the garden. All garden refuse, such as weeds, dead plants, etc., should be kept out of the paths and placed in a refuse or compost heap in the least conspicuous place in the garden. When decomposed it produces a valuable humus for potting plants or for use in flower borders. Early in October the plots should all be cleaned off, spaded, and left in readiness for planting operations the following spring.

The produce from the individual plots should become the property of the respective owners and should be removed by them. The produce from each class plot should be divided amongst the members of the class interested, and that from general experimental plots might be sold by the pupils, the salesman in each case to get a commission of say 10 per cent. on his sales, and the balance to be placed in a general garden fund and used to defray expenses or to purchase tools, pictures, apparatus, etc.

The pupils should be encouraged to give liberally of their flowers to churches and charitable institutions, and every sick-room in the community should be brightened continually by flower bouquets from the school garden. The surplus of plants or the seeds of good varieties should be distributed amongst the people of the section.

Care During Summer Holidays.—Much depends upon how the work has been done before the holidays begin. If all of the above suggestions regarding cultivation and care are faithfully carried out, when the summer holidays arrive the weeds will have been pretty well conquered for the season and the garden plants well advanced. If, however, the best results are to be obtained some attention is necessary during the summer holidays and the pupils should be given to understand at the beginning of the season that they alone are responsible for the care of the plots which have been assigned them. It should be understood also that they will visit their plots once every week during the holidays, or, if absent, they will make arrangements with other pupils to do so. If the work has been conducted in such a way that the interest has been keen throughout the term, the pupils will cheerfully give their plots this necessary care. If the teacher is a resident in the section, he will be able to meet the pupils at the garden occasionally after school closes in June. In the case of large gardens it may be found necessary to arrange with one or two of the older boys or with some suitable man to do extra work in the garden, the cost to be paid by the School Board from such funds as may be available for garden purposes. General care of the garden rathei than care of individual plots should be provided for in this way.

Co-relation.—The extent to which school garden work may be co-related with the ordinary school studies depends largely on the resourcefulness of the teacher. He should take advantage of the garden and of the garden exercises in adding freshness and in giving a practical bearing to subjects which are intrinsically uninteresting to children. Garden work and garden observations afford interesting subject matter for exercises in drawing and composition—interesting because so closely associated with the pupils' own experiences and life interests. Many of our foremost authors and nature poets have idealized the plants of the garden as well as those of the wildwood, so that children's gardening experiences and their own first hand knowledge of plant and animal life, may serve to bring them into a fuller enjoyment of the literature of nature. Many practical problems in arithmetic are suggested, and even demanded, in connection with school gardening. The keeping of garden accounts, for example, may be made a valuable training in bookkeeping and in commercial arithmetic. Weights, measures, values and mensuration are all more or less involved in school gardening. For more advanced classes the study of botany with garden plants and of zoology with garden insects, etc., can be carried on to very great advantage.